

What is the Impact of Tenant Ventilation Practices on PIV System Effectiveness, Compared with Decentralised MVHR?

Executive Summary: This report examines the effectiveness of Positive Input Ventilation (PIV) systems in preventing mould recurrence within UK social housing, with a particular focus on how tenant adherence to required ventilation practices influences this effectiveness. The analysis considers the impact on mould spore levels and maintenance costs over a three-year period. Furthermore, the report evaluates decentralized Mechanical Ventilation with Heat Recovery (dMVHR) systems as a potentially more reliable and cost-efficient alternative that minimizes reliance on tenant behaviour. Findings indicate that while PIV systems can reduce surface condensation, their effectiveness is significantly compromised by inconsistent tenant adherence to crucial practices like keeping trickle vents open and ensuring continuous operation. Moreover, PIV systems carry a risk of forcing moisture into the building fabric, potentially leading to hidden mould growth. While the direct measurement of mould spore count reduction by PIV systems in social housing is challenging, studies using proxy measures show some positive impact. Maintenance costs for PIV systems are relatively low but can increase with heated models. In contrast, dMVHR systems offer a more controlled and automated approach to ventilation with heat recovery, reducing reliance on tenant intervention and mitigating the risk of interstitial condensation. Although the initial installation costs of dMVHR systems can be higher, their long-term reliability, energy efficiency, and reduced dependence on tenant behaviour suggest they may offer a more sustainable solution for preventing mould in UK social housing, particularly in the context of stricter regulations like Awaab's Law. Recommendations include prioritizing ventilation strategies that minimize behavioural dependence, providing comprehensive tenant education, and conducting thorough property assessments to determine the most suitable ventilation solution.

Introduction: The Persistent Problem of Mould in UK Social Housing:

Damp and mould in residential properties pose significant threats to both the health of occupants and the structural integrity of buildings. Exposure to mould spores can trigger a range of adverse health reactions, including allergic responses, the development or exacerbation of asthma, respiratory infections, coughing, wheezing, and shortness of breath.¹ Beyond the physical health impacts, living in a damp and mouldy environment can also lead to worsening mental health, contributing to stress and anxiety.² The tragic death of two-year-old Awaab Ishak in 2020 brought the severe consequences of prolonged exposure to mould into sharp focus, underscoring the urgent need for effective solutions in social housing.¹ The financial burden associated with cold and damp homes is also substantial, with estimates suggesting costs in the billions to the National Health Service each winter in England.⁶ For social housing providers, the presence of mould can lead to rent arrears, increased void periods, legal liabilities, and higher staff costs for remediation.⁷

A primary cause of mould growth in homes is condensation, which occurs when excess moisture in the air comes into contact with cold surfaces.⁹ Inadequate ventilation plays a crucial role in this process by trapping moisture indoors and allowing humidity levels to rise to a point where condensation becomes inevitable.⁹ Effective ventilation, therefore, is not merely a preventative measure but a fundamental requirement for maintaining healthy indoor air quality and preventing the conditions conducive to mould growth.⁹ Maintaining indoor humidity levels between 40% and 60% is generally considered optimal for preventing condensation and black mould growth, and this requires a continuous exchange of air.¹³

Two common ventilation solutions employed in UK social housing to combat condensation and mould are Positive Input Ventilation (PIV) and decentralized Mechanical Ventilation with Heat Recovery (dMVHR). PIV systems operate by introducing a continuous flow of fresh, filtered air into a dwelling, typically from the loft space, creating a slight positive pressure that displaces stale, moisture-laden air.¹³ dMVHR systems, on the other hand, provide a balanced ventilation approach by continuously extracting stale air from rooms where moisture is generated and supplying fresh, preheated air to living areas, while also recovering heat from the outgoing air stream.²⁶ This report aims to analyze the effectiveness of PIV systems in preventing mould recurrence in UK social housing, paying close attention to the influence of tenant adherence to required ventilation practices. It will also evaluate the impact of PIV systems on mould spore counts and maintenance costs over a three-year period. Finally, the report will compare PIV systems with dMVHR systems as a potentially more reliable and cost-efficient solution that minimizes reliance on tenant behaviour.

Understanding Positive Input Ventilation (PIV) Systems:

Positive Input Ventilation (PIV) systems function by drawing fresh air from outside, most commonly from the loft space of a house.¹³ This external air is then passed through a filter to remove particulate matter before being supplied into the living areas of the home.¹³ This process creates a positive pressure within the dwelling, which forces the existing stale, moisture-laden air to be expelled through natural leakage points in the building's fabric, such as small gaps around windows and doors, trickle vents, and extractor fans.¹³ The installation of PIV systems is generally considered inexpensive and not disruptive, with many units capable of being installed in a loft in less than an hour.¹⁶ While loft-mounted units are the most common, wall-mounted options are available for apartments and houses without loft spaces.²¹ Some PIV units are equipped with heaters to warm the incoming air, particularly during colder winter months, although this can impact energy consumption.¹⁵ A crucial component of PIV systems is the filter, which requires regular cleaning or replacement to maintain its effectiveness and prevent the build-up of dust and potential mould growth within the unit itself.¹⁵ The fundamental operating principle of PIV systems, relying on positive pressure to displace air, means their effectiveness is inherently linked to the building's permeability and the unobstructed functioning of these exhaust pathways.

PIV systems are often reported to be effective in reducing surface condensation and improving indoor air quality.¹³ Studies have indicated that PIV systems can reduce indoor humidity levels by a significant margin, in some cases up to 30%, and eliminate condensation in a high percentage of studied homes.¹⁹ Furthermore, by continuously introducing fresh, filtered air, these systems can improve overall indoor air quality by diluting and displacing pollutants, allergens, and volatile organic compounds (VOCs).¹³ Feedback from tenants who have had PIV systems installed often highlights a noticeable reduction in mould and an improvement in the general air quality within their homes.⁵⁰ One survey of social housing residents in Mid Devon reported an 85% positive response rate regarding the effectiveness of PIV systems, with 55% stating that they experienced no more issues with mould after installation.⁵⁰ However, the success of PIV systems is not always consistent and can be influenced by various factors specific to the property and its environment.

Despite the reported benefits, there are potential drawbacks and risks associated with PIV systems, particularly concerning their potential to force moisture into the fabric of the building.¹⁵ The positive pressure created by these systems, while intended to expel moist indoor air, can inadvertently push this air into structural cavities such as wall voids and roof spaces.¹⁵ This can lead to interstitial condensation, where moisture condenses within the layers of the building structure, potentially resulting in hidden mould growth.¹⁵ A concerning statistic from a 2023 monitoring study indicated that 22% of homes fitted with PIV systems developed hidden mould within 18 months, suggesting a link between PIV use and an increased risk of this issue.¹⁵ The effectiveness of PIV systems is also heavily reliant on achieving a balance between the rate at which

fresh air is supplied and the rate at which moisture is generated by occupants through daily activities.¹⁵ In modern, more airtight buildings, PIV systems may be less effective because the positive pressure may not be sufficient to adequately expel the moist air.¹⁵ Furthermore, if the external air being drawn into the property has consistently high humidity levels, the PIV system might not be as effective in reducing indoor humidity and could even introduce more moisture.¹⁵ It has also been noted that some PIV systems are designed to shut off at higher temperatures (around 27 degrees Celsius), which means they offer no ventilation at all during warmer periods when it might still be needed.⁵¹ These potential drawbacks highlight the need for careful consideration when deploying PIV systems, particularly in social housing where building conditions and occupant lifestyles can vary significantly.

The Influence of Tenant Adherence on PIV System Effectiveness:

The effectiveness of PIV systems in preventing mould recurrence is intrinsically linked to tenant adherence to several key ventilation practices. These practices primarily involve ensuring that the pathways for air to be expelled from the property remain clear and that the PIV system itself is functioning as intended. A crucial aspect of this is keeping trickle vents in windows open.¹⁵ PIV systems rely on these vents, along with other natural leakage points, to allow the positive pressure created by the unit to push out the stale, moisture-laden air.¹⁵ If these vents are blocked or closed by tenants, the airflow through the property will be significantly hindered, reducing the system's ability to effectively remove humidity.⁵¹ Similarly, maintaining door gaps, ideally around 10mm, is important for allowing air to circulate freely throughout the entire property.¹⁵ This ensures that the fresh air introduced by the PIV system can reach all rooms and displace the existing air, preventing pockets of stagnant, humid air where mould is more likely to grow.¹⁵ Finally, it is essential for tenants to ensure that the PIV unit itself remains operational and is not inadvertently switched off or obstructed by stored items.¹⁵ Continuous operation is key to maintaining the positive pressure and consistent airflow required for effective ventilation and mould prevention.¹⁵

Achieving consistent tenant adherence to these ventilation practices can be challenging in social housing settings. Tenants may close trickle vents due to concerns about draughts, especially during colder months, or due to noise from outside.¹⁵ They might not fully understand the purpose of these vents or the role they play in the overall ventilation strategy of the property.⁵¹ Similarly, tenants might switch off PIV units if they perceive them as causing discomfort, such as blowing in cold air during winter, or if they are concerned about the energy costs associated with running the unit, particularly if it includes a heater.¹⁵ Lack of adequate understanding about how PIV systems work and the necessity of these specific practices can also contribute to non-adherence.⁵⁸ Relying on consistent tenant behaviour thus presents a significant hurdle for the long-term effectiveness of PIV systems in social housing, where diverse tenant demographics and varying levels of awareness can influence the success of such ventilation strategies.

Evidence from studies suggests that tenant behaviour can indeed impact the effectiveness of ventilation systems. A Zehnder study ⁵⁸ revealed that over half of social housing tenants admitted to turning off extractor fans in their bathrooms and kitchens, often the only form of localized ventilation in these moisture-prone areas. This behaviour, driven by factors like perceived heat loss, running costs, noise, or simply a belief that the fans are not needed, indicates a potential for similar patterns of non-adherence with PIV systems if tenants do not fully understand their benefits or perceive negative impacts. Furthermore, the same study highlighted that a large majority of landlords believe that a lack of education among occupants regarding healthy living practices, including proper ventilation, is a major barrier to effectively addressing mould problems in their properties.⁵⁸ This underscores the point that ventilation solutions that require active and consistent tenant participation may face significant challenges in achieving their intended outcomes in the social housing sector.

Measuring the Impact of PIV Systems: Mould Spore Counts and Maintenance Costs:

While the ultimate goal of installing PIV systems is to reduce or eliminate mould, obtaining direct and long-term data on the reduction of mould spore counts in real-world social housing settings is a complex undertaking. The provided research material contains limited direct measurements of airborne mould spore levels in relation to PIV system usage. However, a study conducted by Vent-Axia 18 measured the levels of Total Mould Volatile Organic Compounds (TMVOC) in a home before and after the installation of a PIV system. TMVOCs are indicators of actively growing mould, and the study found a significant 67% reduction in these levels after the PIV system was installed. While TMVOC levels are not a direct measure of airborne mould spore counts, they serve as a valuable proxy for assessing the impact of ventilation on mould growth. Conducting comprehensive studies that directly measure mould spore counts over a three-year period in diverse social housing properties would involve considerable logistical challenges, including the need for consistent monitoring, controlling for external environmental factors, and accounting for variations in tenant behaviour and occupancy levels. Therefore, while direct data on mould spore count reduction may be limited, the evidence from studies using related metrics like TMVOC levels suggests that PIV systems can have a positive impact on reducing active mould growth.

Assessing the maintenance costs associated with PIV systems over a three-year period requires considering several factors, including the initial cost of the unit and installation, the ongoing running costs, and the expenses related to filter replacement. The initial cost for a PIV unit can range from approximately £250 to £850, with more advanced models potentially costing up to £1000.⁶⁴ Professional installation typically adds another £150 to £350 to this initial outlay.⁶⁴ Some companies also offer fixed-price installation packages, which can provide a more predictable upfront cost, such as one provider offering a national supply and install service for £795 plus VAT.⁶⁵ The running costs for PIV systems are generally considered low, particularly for non-heated units, which can cost as little as £5 to £15 per year to run.²¹ However, if a heated PIV unit is chosen, the running costs can increase significantly, ranging from £60 to over £300 per year depending on the model and usage.¹⁵ Filter replacement is another recurring maintenance cost. The frequency of filter replacement can vary from every 6 to 12 months to every 3 to 5 years, depending on the quality of the filter and the level of pollution in the area.¹⁵ The cost of replacement filters can range from £10 to £50 per year.¹⁵ Over a three-year period, the estimated maintenance costs for a non-heated PIV system, excluding potential unforeseen repairs, could range from approximately £445 to £1395 (initial cost + installation + three years of running costs + three years of filter costs). For heated units, this figure could be substantially higher due to the increased energy consumption. While PIV systems are generally considered low maintenance, these costs should be factored into the overall assessment of their long-term financial implications for social housing providers.

Decentralized Mechanical Ventilation with Heat Recovery (dMVHR): A Less Behaviourally Dependent Alternative:

Decentralized Mechanical Ventilation with Heat Recovery (dMVHR) systems offer an alternative approach to ventilation that can minimize reliance on tenant intervention while providing effective moisture control and energy efficiency.²⁶ These systems operate on the principle of balanced ventilation, continuously extracting stale, moisture-laden air from individual rooms, such as bathrooms and kitchens, and simultaneously supplying fresh, filtered, and preheated (or precooled) air to living areas like bedrooms and living rooms.²⁶ A key feature of dMVHR systems is their ability to recover heat from the outgoing stale air and transfer it to the incoming fresh air via a heat exchanger, with some systems claiming heat recovery efficiencies as high as 85% to 99%.²⁶ This heat recovery significantly reduces the energy required for heating, leading to lower energy bills and a reduced carbon footprint.²⁸ Unlike centralized MVHR systems, dMVHR units are typically wall-mounted and operate on a per-room basis, eliminating the need for extensive ductwork

throughout the property, which makes them particularly well-suited for retrofit projects in existing social housing stock.²⁶ In addition to controlling humidity and preventing mould growth ²⁷, dMVHR systems also improve indoor air quality by continuously filtering out pollutants, allergens, and odours.²⁸ Some advanced dMVHR systems offer smart features, including integration with smartphones and smart home devices, as well as sensors for carbon monoxide, VOCs, and radon, allowing for automated and efficient operation.²⁸

One of the key advantages of dMVHR systems in the context of social housing is their ability to minimize reliance on tenant intervention for effective ventilation and moisture control.²⁶ These systems are designed for continuous operation at a low level, providing a constant exchange of air without requiring tenants to actively switch them on or off.²⁷ In wet rooms like bathrooms and kitchens, dMVHR units can offer automated humidity control, extracting moisture at its source and reducing the need for tenants to manually operate extractor fans or open windows.²⁶ This localized control is a significant benefit compared to PIV systems, which rely on a whole-house positive pressure approach and may not effectively address high levels of humidity generated in specific areas.²⁶ Furthermore, dMVHR systems do not rely as heavily on trickle vents or maintaining door gaps for effective ventilation throughout the property, as each unit provides a dedicated pathway for air exchange in the room where it is installed.²⁶ Advanced smart dMVHR systems can further reduce tenant involvement by automatically adjusting ventilation rates based on occupancy and air quality readings from built-in sensors.²⁸ This automated and continuous nature of dMVHR systems makes them a potentially more reliable solution for mould prevention in social housing, where consistent tenant adherence to ventilation practices can be a challenge.

The ability of dMVHR systems to offer more localized and automated humidity control presents a significant advantage over PIV systems. By installing dMVHR units in individual rooms, particularly those where high levels of moisture are typically generated, such as bathrooms and kitchens, ventilation can be targeted directly at the source of the humidity.²⁶ Many dMVHR units are equipped with built-in humidity sensors that can automatically detect increases in moisture levels and boost the ventilation rate in response.³⁴ This demand-controlled ventilation ensures that moisture is effectively removed from these critical areas, minimizing the risk of condensation and subsequent mould growth, without requiring any manual intervention from the tenant.³⁴ This localized and automated approach to humidity management offers a more efficient and less intrusive way to maintain healthy indoor air quality compared to the whole-house positive pressure strategy of PIV systems, which may not always be as effective in addressing specific areas of high moisture production.

Comparative Analysis: Cost-Efficiency and Reliability of PIV vs. dMVHR Systems:

When comparing the cost-efficiency of PIV and dMVHR systems for social housing, several factors need to be considered, including installation costs, running costs, and maintenance costs. PIV systems generally have a lower upfront installation cost, ranging from approximately £400 to £1200, with some fixed price options available around £954 including VAT.⁶⁴ In contrast, dMVHR systems tend to be more expensive to install, particularly for whole-house ventilation, as they may require multiple units and potentially more complex installation processes, although ductless options for single rooms can be more straightforward.²⁶ Single-room dMVHR units can range in price from around £350 to over £1000 per unit ⁷⁰, and providing whole-house ventilation with multiple units would significantly increase the overall installation cost.

In terms of running costs, non-heated PIV systems are very energy-efficient, with estimated costs ranging from just £5 to £15 per year.²¹ Heated PIV units, however, can lead to substantially higher running costs, potentially exceeding £300 per year depending on usage and the unit's wattage.¹⁵ dMVHR systems also boast low running costs per unit, with estimates around £4 per fan per year.³⁵

While the total running cost for a whole house equipped with multiple dMVHR units would be higher than that of a non-heated PIV system, it could potentially be lower and more efficient than a heated PIV system due to the heat recovery feature, which reduces the demand on the property's heating system.²⁸

Both PIV and dMVHR systems require regular maintenance, primarily involving the cleaning or replacement of filters. For PIV systems, the annual cost of filter replacement is estimated to be between £10 and £50.¹⁵ dMVHR systems also require filter maintenance, with the cost for a pair of filters ranging from £25 to £125.²⁸ Additionally, dMVHR systems may require periodic servicing by a professional technician, typically every 3 to 5 years, which would incur additional costs.⁶⁸ Therefore, while the annual filter costs might be comparable, the potential need for servicing multiple units in a dMVHR system could lead to slightly higher overall maintenance expenses compared to a single PIV unit.

In terms of reliability in preventing mould recurrence, PIV systems are more dependent on tenant behaviour, particularly regarding keeping trickle vents open and ensuring the unit remains operational.¹⁵ There is also a recognized risk that PIV systems can force moisture into the building fabric, potentially leading to hidden mould growth.¹⁵ While some studies have reported high success rates for PIV in addressing condensation and mould ⁴⁷, others have shown inconsistent results in reducing humidity levels across different rooms.⁵¹ dMVHR systems, on the other hand, offer greater reliability due to their continuous and automated operation, which minimizes the need for tenant intervention.²⁷ By controlling humidity at the source in wet rooms and providing balanced ventilation throughout the property, dMVHR systems reduce the risk of both surface and interstitial condensation.²⁷ While there have been some concerns raised about the extraction rates of dMVHR units in very damp bathrooms compared to traditional extractor fans ³⁷, overall, dMVHR appears to be a more reliable long-term solution for preventing mould recurrence, especially in the context of increasingly airtight building standards.

Feature	PIV System	dMVHR System
Operating Principle	Positive pressure, forces air out	Balanced ventilation with heat recovery, extracts and supplies air
Installation Cost	Lower (£400 - £1200)	Higher (single room £350+, whole house significantly more)
Running Cost (per year)	£5-£15 (non-heated), £60-£300+ (heated)	Low per unit (£4 approx.), whole house depends on number of units
Maintenance Cost (annual)	£10-£50 (filter)	£25-£125 (filter pairs), plus periodic servicing
Tenant Reliance	High (trickle vents, operation)	Low (continuous, automated)
Heat Recovery	No (some heated models increase heating bills)	Yes (up to 99% recovery, reduces heating demand)
Risk of Hidden Mould	Higher (potential to force moisture into fabric)	Lower (balanced pressure, localized control)
Best Suited For	Existing, less airtight homes with surface condensation	New builds and retrofits, energy-efficient homes, areas with high humidity

Regulatory and Social Housing Context:

The selection of ventilation strategies for social housing in the UK is increasingly influenced by building regulations and legislation aimed at ensuring safe and healthy living conditions. Approved Document F of the Building Regulations (Ventilation) now prioritizes Mechanical Extract Ventilation (MEV) and Mechanical Ventilation with Heat Recovery (MVHR) systems as preferred methods for

achieving effective ventilation in modern, more airtight homes.⁵¹ While PIV systems are still permitted as an alternative ventilation strategy, they must demonstrate compliance with the regulations, often requiring a British Board of Agrément (BBA) Certificate.⁸² This shift in regulatory focus reflects a growing recognition of the limitations of PIV systems, particularly in well-insulated properties, and the need for more controlled and efficient ventilation solutions.

A significant development in the regulatory landscape is the introduction of Awaab's Law, which forms part of the Social Housing Regulation Act 2023.² This law mandates strict legal expectations for social housing landlords to investigate and rectify reports of damp and mould within specific timeframes, or to rehouse tenants in safe accommodation if necessary.² Failure to comply with these requirements can result in severe penalties, including unlimited fines and the implementation of Ofsted-style inspections by the Regulator of Social Housing.¹² Furthermore, the Decent Homes Standard, which applies to social housing, requires that properties are free of serious hazards, including damp and mould, and that they provide a reasonable degree of thermal comfort, which is closely linked to effective ventilation.³ Government guidance has also emphasized that landlords are responsible for addressing the underlying causes of damp and mould, such as structural issues or inadequate ventilation, and has cautioned against blaming tenants for these problems.¹² This evolving regulatory context places increasing pressure on social housing landlords to adopt robust and reliable ventilation strategies that effectively prevent damp and mould, ensuring the health and safety of their tenants and compliance with the law.

When considering ventilation strategies for social housing, it is also important to take into account the specific demographics and potential challenges faced by tenants. Social housing residents are often more likely to be living in poverty and may struggle to afford adequate heating, which can exacerbate condensation and mould problems.² Higher occupancy rates in some social housing properties can also lead to increased levels of moisture production within the home.⁷ Additionally, tenants may have varying levels of understanding regarding the proper use and importance of ventilation systems.⁸ Vulnerable tenants, such as the elderly or those with pre-existing health conditions, may be more sensitive to cold draughts or find it difficult to manage ventilation effectively.² Therefore, when selecting ventilation solutions for social housing, it is crucial to consider these factors and prioritize systems that are less reliant on active and consistent tenant intervention to ensure their effectiveness and suitability for the diverse needs of the residents.

Recommendations for Housing Associations and Policymakers:

Based on the analysis presented in this report, the following recommendations are put forth for housing associations and policymakers seeking to address the persistent problem of mould in UK social housing:

1. **Prioritize Ventilation Strategies with Minimal Behavioural Dependence:** Given the challenges in achieving consistent tenant adherence to required ventilation practices, housing associations should prioritize the adoption of ventilation systems that minimize this reliance. Decentralized MVHR systems, with their continuous and automated operation, offer a more reliable approach to moisture control and mould prevention compared to PIV systems.
2. **Provide Comprehensive Tenant Education for Existing PIV Installations:** For social housing properties where PIV systems are already installed, it is crucial to provide clear and accessible guidance to tenants on the importance of keeping trickle vents open and ensuring the PIV unit remains operational. Consider utilizing smart PIV units equipped with sensors that can automatically adjust airflow based on humidity levels, reducing the need for manual adjustments by tenants.
3. **Invest in Tenant Education Programs:** Housing associations should invest in comprehensive education programs aimed at raising tenant awareness about the causes of

condensation and mould, the health risks associated with them, and the proper use of ventilation systems installed in their homes. This education should be tailored to the specific needs and understanding levels of social housing residents.

4. **Conduct Thorough Property Assessments:** Before implementing any ventilation strategy, housing associations should conduct thorough assessments of their properties to determine the most suitable solution based on factors such as building type, airtightness, occupancy levels, and the specific needs of the tenants. Special consideration should be given to the potential risks of PIV systems in certain property types, particularly those that are more airtight or have high internal moisture generation.
5. **Explore the Long-Term Cost-Effectiveness of dMVHR Systems:** While the initial installation costs of dMVHR systems can be higher than PIV systems, housing associations should carefully evaluate their long-term cost-effectiveness, taking into account the potential for energy savings due to heat recovery and the anticipated reduction in costs associated with mould remediation and tenant health issues.
6. **Incorporate Ventilation System Maintenance into Regular Schedules:** Ventilation systems, regardless of type, require regular maintenance to ensure their continued effectiveness. Housing associations should incorporate routine checks and filter replacements for PIV and dMVHR systems into their property maintenance schedules. Consider utilizing PIV units with data logging features to monitor system usage and identify any potential issues.
7. **Ensure Full Compliance with Awaab's Law:** In light of the stringent requirements of Awaab's Law, social housing landlords must adopt a proactive approach to preventing damp and mould. This includes implementing effective ventilation strategies and responding promptly and effectively to any reports of damp and mould from tenants.
8. **Consider a Phased Approach to Ventilation Upgrades:** For housing associations managing a large portfolio of properties, a phased approach to upgrading ventilation systems may be the most practical. This could involve prioritizing properties with a history of recurrent damp and mould issues or those housing vulnerable tenants for initial upgrades to more reliable and less behaviourally dependent systems like dMVHR.

Conclusion:

The persistent issue of damp and mould in UK social housing has profound implications for the health and well-being of tenants and presents a significant financial and regulatory challenge for landlords. While Positive Input Ventilation (PIV) systems have been a common approach to combatting surface condensation and improving air quality, their effectiveness is significantly influenced by tenant adherence to specific ventilation practices and they carry a potential risk of exacerbating moisture issues within the building fabric. The analysis indicates that relying on consistent tenant behaviour for optimal PIV performance in the diverse context of social housing presents a considerable challenge. In contrast, decentralized Mechanical Ventilation with Heat Recovery (dMVHR) systems offer a more reliable and less behaviourally dependent solution for long-term mould prevention and improved indoor air quality, alongside the added benefit of energy efficiency through heat recovery. Although the initial costs associated with dMVHR systems can be higher, their automated operation and localized control of humidity address key limitations of PIV systems and align more closely with the increasing regulatory pressures and the need to provide healthy and safe homes for social housing residents. Adopting evidence-based ventilation strategies that prioritize tenant health, regulatory compliance, and long-term cost-effectiveness is crucial for effectively addressing the pervasive problem of mould in the UK social housing sector.

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